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A Review of the Spider Family Symphytognathidae (Arachnida, Araneae)

RAYMOND R. FORSTER¹ AND NORMAN I. PLATNICK²

ABSTRACT

The spider family Symphytognathidae is re-limited to include only the genera *Symphytognatha*, *Globignatha* (elevated from sub-generic status), *Patu*, *Anapistula*, and the new genus *Curimagua*, all of which share the following derived characters: the chelicerae are fused at least at their base, the female pedipalp is either reduced to a unisegmented lobe or absent, the labium is much wider than long, and the sternum is broadly truncate posteriorly. Other genera previously placed in the family belong to the Anapidae, Mysmenidae, Micropholcommatidae, and Textricellidae. The status of the genus *Iardiniis* is discussed; *I. albulus* Gertsch is transferred

to *Styposis* (Theridiidae), *I. boneti* (Forster) is returned to *Anapistula*, and *I. weyersi* Simon is considered a *nomen dubium*. Eleven new species are described: *Symphytognatha blesti* from Australia; *S. goodnightorum* from Belize; *S. gertschi* from Mexico; *S. chickeringi* from Jamaica; *Globignatha sedgwicki* from Belize; *Patu eberhardi*, *P. digua*, and *P. saladito* from Colombia; *Anapistula benoiti* from Zaire; *Curimagua chapmani* from Venezuela; and *C. bayano* from Panama. The male of *Anapistula secreta* Gertsch is described for the first time, and the species is newly recorded from Florida, Jamaica, Costa Rica, and Colombia.

INTRODUCTION

The spider family Symphytognathidae was established by Hickman (1931) for the Tasmanian species *Symphytognatha globosa*, remarkable for its minute size, the absence of book lungs and female pedipalps, and the fusion of the chelicerae. Since that time, Fage (1937), Gertsch (1941, 1960), Forster (1959), and Levi and Levi (1962) have added to the group numerous other genera characterized mainly by minute size (of-

ten less than 1 mm. in total length) and the absence of book lungs. In recent years, it has become apparent that although this grouping is convenient from a phenetic point of view, the family as thus constituted may be highly polyphyletic, and that many of the included genera may be more closely related to the Araneidae, Theridiidae, or Theridiosomatidae than to each other. Brignoli (1970), Levi and Randolph

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(1975), and Lehtinen (1975) have all expressed this view; as the last author phrased it, "the Symphytognathidae, as it has been limited by most of the recent authors, is surely a polyphyletic dump heap of minute Araneoidea."

As indicated by Hennig (1965), monophyletic groups can be recognized only by the presence of shared and uniquely derived (synapomorphic) characters. The question in this case is thus whether or not there are such synapomorphic characters uniting the genera presently placed in the Symphytognathidae. A number of characters common to most or all of these genera (the absence of book lungs, a claw on the female pedipalp, and leg spines other than male clasping spines; the fusion of the labium and sternum; and the shortening of the metatarsi) can be considered derived as compared with their homologous states in other araneoid families. These characters may represent synapomorphies or parallelisms, that is, they may have been derived only once or more than once. Many of them may indeed be parallelisms associated with the small size of these spiders; the multiplicity of somatic forms, genitalic structures, and web-building behaviors in these genera, and the fact that most of these characters are loss (or negative) characters all support the possibility of multiple parallelisms. A decision as to whether these characters are synapomorphies or parallelisms can only be made by first detecting smaller monophyletic groups of these genera and then determining whether the pattern of shared derived characters supports a hypothesis of relationship amongst themselves or with other araneoid families.

The present paper is an attempt to determine which of the genera currently assigned to the family can actually be considered, on the basis of shared derived characters, to be members of a monophyletic group including *Symphytognatha*. Several characters suggest that the genera *Globignatha* (here elevated from subgeneric status), *Patu*, *Anapistula*, and the new genus *Curimagua*, together with *Symphytognatha*, form such a monophyletic group. All these spiders have chelicerae that are fused together; in some cases (*Patu*) the fusion is limited to the base of the chelicerae, can be detected only when an attempt is made to remove the chelicerae from the carapace, and has therefore been overlooked in some

previously published descriptions, whereas in other cases (*Symphytognatha* and *Globignatha*) the chelicerae are fused for most of their length. Other presumably derived characters uniting these genera are the reduction of the female pedipalp to a short, unsegmented lobe (*Curimagua*) or its complete absence, the shape of the labium, which is at least three times as wide as long, and the wide posterior truncation of the sternum separating the posterior coxae by at least twice their width.

The question of what the closest relative of this monophyletic group may be is one that we cannot yet answer. Study of representatives of the other symphytognathoid genera indicates to us that most of the family-group names that have been proposed for these spiders represent distinct groups: the Anapidae (Simon, 1895), containing *Anapis*, *Anapisona*, *Anapogonia*, *Chasmocephalon*, *Conoculus*, *Crozetulus*, *Epechtina*, *Epechtinula*, *Pseudanapis*, and *Risdonius*; the Mysmenidae (Petrunkevitch, 1928), including *Mysmena*, *Mysmenopsis*, *Trogloneta*, and possibly *Cepheia*, *Lucarachne*, *Maymena*, *Synaphris*, and *Taphiassa*; the Micropholcommatidae (Hickman, 1944), containing *Micropholcomma* and probably *Parapua* and *Pua*; and the Textricellidae (Hickman, 1945), including *Textricella* and possibly *Pararchaea* (currently placed in the Archaeidae). Whether these groups are actually monophyletic can be determined only after they are revised. At present, we see no synapomorphic characters that would support a closer relationship of *Symphytognatha* and its relatives to any one of these groups than to another; the broadly truncate sternum suggests a possibly close relationship with the Theridiosomatidae instead.

Certainly some of the best clues to relationships will come from the web-building behavior of these spiders; it is unfortunate that the webs of so few species are known. Marples (1951) originally reported that *Patu samoensis* and *Patu vitiensis* spin 4-6 mm. wide horizontal sheet webs against tree trunks, but later (1955) recognized that in the former species from Samoa the webs are actually orbs with the spirals placed so closely that the web looks like a sheet; Forster (1959) subsequently reported comparable observations for *P. vitiensis* in Fiji. William G. Eberhard has observed a similar horizontal orb web of

fine mesh constructed by the Colombian species *Patu saladito* (fig. 1). However, the other species whose web is known, *Symphytognatha globosa* from Tasmania, does not appear to make an orb web. V. V. Hickman reports (*in litt.*) that "As far as I have been able to observe both in the field and the laboratory, the web consists of a few irregular threads in a more or less horizontal plane. The spider rests below them in an inverted position. In the field the spider is most often found on the underside of loose stones in cool and shady situations, sometimes along the banks of creeks. It does not move very quickly and the web seems to be made on the under-surface of the stone. . . . The threads do not appear to be adhesive." Since available data indicate that *Symphytognatha* is one of the most apomorphic members of this lineage, it is possible that the group as a whole was derived from an orb-

weaving stock and that some members have lost the ability (or need) to construct regular webs. It should be pointed out that the relatively plesiomorphic species *Curimagua bayano* has been collected on the webs of diplurid spiders in Panama; *Lucarachne* are also frequently found in that habitat.

Any discussion of relationships within the Symphytognathidae (as here restricted) must be tempered with the realization that the few known species represent only the tip of the iceberg. Because of their minute size, these spiders are usually collected only when specifically searched for or when they happen to be taken by Berlese funnel sampling. The close relationships shown by such geographically disparate species as *Anapistula secreta* in the northern Neotropical region and *Anapistula australis* in Queensland indicate that these spiders are probably very wide-

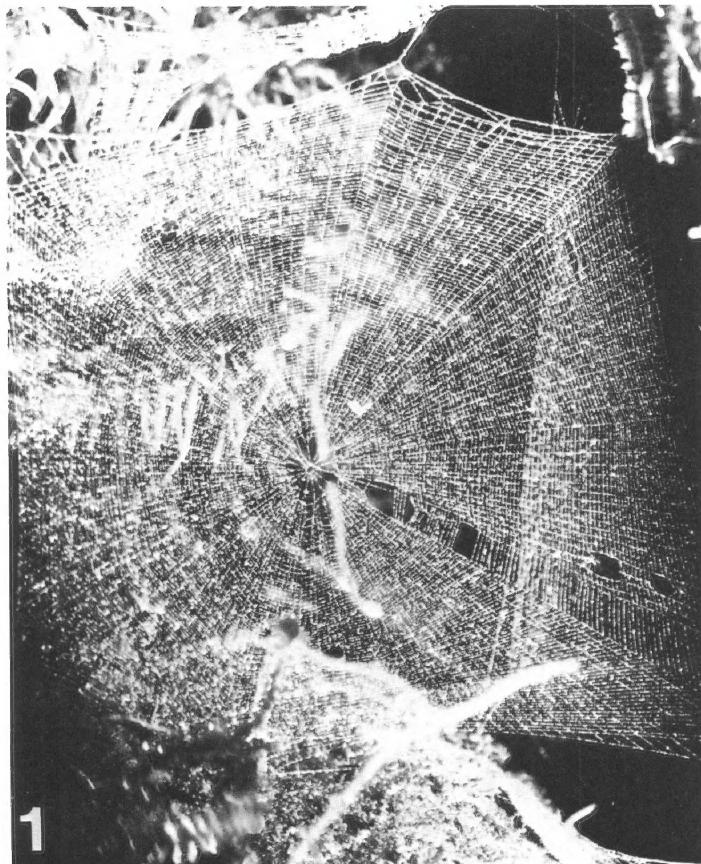


FIG. 1. Horizontal orb web of *Patu saladito* in Colombia. Photograph by W. G. Eberhard.

spread; almost certainly, careful collecting will reveal many additional species in South America, Africa, Asia, Australia, and the Pacific islands. Because of this, we have adopted a rather conservative generic classification retaining as much flexibility as possible for the future. For example, although the known New World *Sympytognatha* can be distinguished by cheliceral characters from their Australian counterparts, the presence of an autapomorphic character demonstrating the monophyly of the group (multidentate superior claws on the anterior legs) makes it seem best to retain them in a single genus until the worldwide nature of the group is revealed in greater detail. Some comments on the interrelationships of the known species are possible, however. The almost complete fusion of the chelicerae in *Sympytognatha* and *Globignatha* indicates that the two genera are sister groups and the most apomorphic members of the lineage; although the extreme fusion raises doubts about the functionality of the chelicerae in these genera, the fangs do bear an opening on their retrolateral side that presumably leads to a poison gland. Probably either *Anapistula* or *Curimagua* is the most plesiomorphic member; *Anapistula* retain the posterior spiracles leading to tracheae that penetrate through to the cephalothorax (Forster, 1959, fig. 158) and lack the elevated pars cephalica of the other forms; *Curimagua* have the eyes in triads rather than diads, retain a remnant of the pedipalp in females, and have only slight lobes (rather than distinct teeth) on the cheliceral margins.

The minute size of these spiders (the male of the new species *Patu digua*, total length 0.37 mm., appears to be the world's smallest known spider) makes working with them difficult; many characters, particularly important cheliceral and palpal ones, are difficult or impossible to resolve under light microscopy and can be seen in detail only with the aid of the scanning electron microscope. We have therefore not hesitated to use one palp or chelicera, even of a unique specimen, for scanning observation. Generally the entire spider was placed on a stub and then relevant parts dissected off; this eliminated the hazards of attempting to transfer tiny structures. After examination, specimens were returned to alcohol;

although dry, the weight of their metal coating insures that they sink and will eventually resorb the alcohol lost by drying. In cases where subsurface characters had to be examined, as in the palpi of *Anapistula*, compound microscopy of temporary mounts in lactophenol had to suffice. Unfortunately, some characters, particularly the presence or absence of a colulus, remained essentially undetectable by either method.

We are indebted to Dr. H. W. Levi of the Museum of Comparative Zoology, Harvard University (MCZ) for lending much of the material on which this work is based and for confirming our placement of *Iardinis albulus*. Through the courtesy of Drs. H. S. Dybas and J. B. Kethley, material was also made available from the Berlese sample sorting program of the Field Museum of Natural History (FMNH). Dr. P. L. G. Benoit of the Musée Royal de l'Afrique Centrale (MRAC) provided African specimens. Type specimens were kindly lent by Drs. M. Hubert of the Muséum National d'Histoire Naturelle, G. Rack of the Zoologisches Museum, Universität Hamburg, E. Taylor of the Hope Department of Entomology, Oxford University, and F. R. Wanless of the British Museum (Natural History). Representatives of Japanese species were kindly donated by Dr. Takeo Yaginuma. Also used were collections of the Otago Museum (OM) and the American Museum of Natural History (AMNH), including material made available by Dr. W. J. Gertsch. Mr. Robert J. Koestler provided his special artistry with the scanning electron microscope. Special thanks go to Drs. W. G. Eberhard and V. V. Hickman for making relevant natural history data available, and to Dr. M. U. Shadab for help with illustrations.

All measurements cited below are in millimeters.

SYMPHYTOGNATHIDAE HICKMAN

Sympytognathidae Hickman, 1931, p. 1328
(type genus *Sympytognatha* Hickman). Roe-
wer, 1942, p. 1014. Bonnet, 1958, p. 4202.

Diagnosis. The combination of chelicerae fused at least at their base and the pedipalp of the female being reduced to one or zero segments is sufficient to distinguish symphytognathids (in

our restricted sense) from all other araneoid spiders.

Description. Chelicerae diaxial, fused together at least at their base, without lamellae. Clypeus high. Labium fused to sternum, at least three times as wide as long. Sternum broadly truncate posteriorly. Female pedipalp reduced to small unisegmented lobe or entirely absent. Without cribellum or calamistrum. Without book lungs, with anterior pair of spiracles leading to tracheae restricted to abdomen or extending into cephalothorax, sometimes with additional posterior pair of spiracles situated in advance of spinnerets, leading to tracheae extending into cephalothorax. Six or four eyes in triads or diads. Genitalia entelegyne. Six spinnerets in circle, colulus sometimes present, anal tubercle unmodified. Abdomen without scuta. Legs prograde, without spines except under anterior metatarsi of some males, not scopulate; tarsi with three claws, longer than metatarsi, without claw tufts, combs, or trichobothria. Palpal femur, patella, and tibia without apophyses.

Misplaced and Uncertain Names. The genus *Iardinis* is a source of some confusion. Simon (1899) established the genus for *Iardinis weyersi*, a species from Sumatra, and placed it in the Theridiidae. The type specimen unfortunately has been lost. Gertsch (1960) transferred *Iardinus* (a misspelling of the name) to the Symphytognathidae and placed in it two American species. One, *Iardinis albulus* Gertsch from Guyana, was based on a female with normal pedipalps; the eye pattern and epigynal details indicate that the species actually belongs to *Styposis* (Theridiidae, NEW COMBINATION); this placement has been confirmed by Dr. H. W. Levi. The other, *Iardinis boneti* (Forster), was transferred from *Anapistula*, and is below returned to that genus; the non-elevated pars cephalica and particularly the close resemblance of the male palp to that of *Anapistula secreta* support that placement. Thus, *I. weyersi* Simon is the only species remaining in the genus. Levi and Levi (1962, p. 22), in their review of the world theridiid genera, commented: "No specimens known to exist. Species description not recognizable. Probably in Pholcidae. Might be a synonym of *Styposis*." The name is best considered a

nomen dubium until the type or other Sumatran specimens become available.

KEY TO GENERA OF SYMPHYTOGNATHIDAE

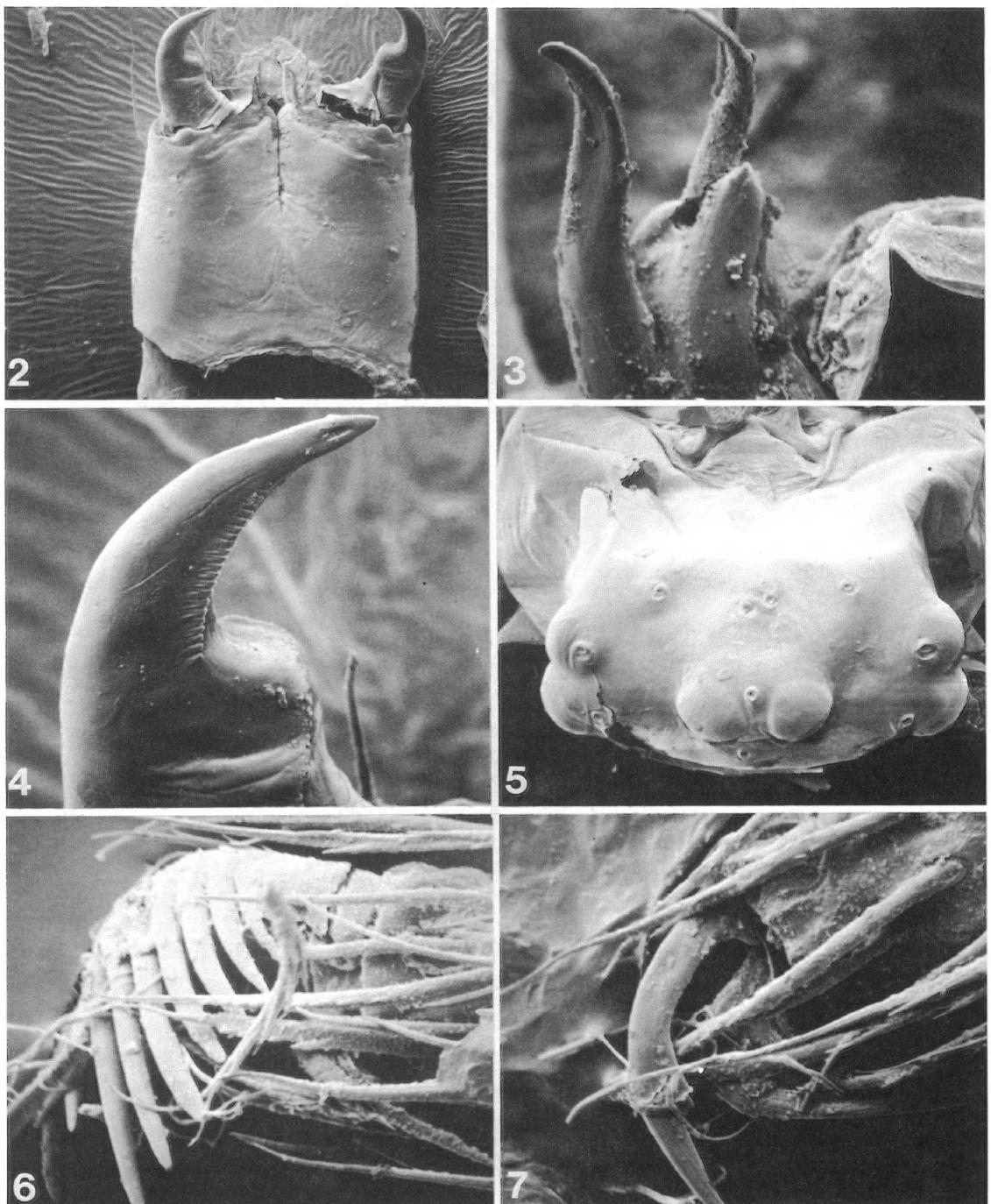
1. Chelicerae fused for most of their length (figs. 2, 31, 35, 41) 2
- Chelicerae fused only near their base (figs. 45, 63) 3
2. Suture line visible between chelicerae (figs. 2, 31, 35); superior claws of legs I and II multidentate (figs. 6, 33). *Symphytognatha* Suture line not visible between chelicerae (fig. 41); superior claws of legs I and II not multidentate (fig. 44) *Globignatha*
3. Eyes in triads (fig. 40); female palp present (fig. 63); chelicerae without teeth, with low lobes only (fig. 64) *Curimagua*
- Eyes in diads (as in figs. 5, 23, 39); female palp absent (as in fig. 24); chelicerae with teeth (figs. 46, 62) 4
4. Pars cephalica elevated, much higher than pars thoracica (Forster, 1959, figs. 118, 124) *Patu*
- Pars cephalica not much higher than pars thoracica (Gertsch, 1941, fig. 14) *Anapistula*

SYMPHYTOGNATHA HICKMAN

Symphytognatha Hickman, 1931, p. 1328 (type species by original designation *Symphytognatha globosa* Hickman). Roewer, 1942, p. 1015. Bonnet, 1958, p. 4201.

Diagnosis. Both the chelicerae being fused for most of their length with a suture line visible between them and the presence of multidentate superior claws on legs I and II are diagnostic of *Symphytognatha*.

Description. Carapace widest between coxae II and III, broadly truncate anteriorly, highest at rear of ocular area; pars cephalica greatly elevated, vertical posteriorly, pars thoracica steeply sloping. Six eyes in three diads. From above, posterior eye row strongly recurved. Sternum convex, globose, longer than wide, fourth coxae separated by at least twice their width. Labial suture line straight. Endites wider than long, strongly convergent, rounded into semicircle anteriorly. Chelicerae fused for about four-fifths of their



FIGS. 2-7. *Sympytnathus globosa* Hickman, male. 2. Chelicerae, posterior view, 275 \times . 3. Cheliceral teeth, posterior view, 2750 \times . 4. Fang, posterior view, 1375 \times . 5. Carapace, dorsal view, 240 \times . 6. Claws of leg I, lateral view, 2500 \times . 7. Claws of leg III, lateral view, 2500 \times .

length, with suture line visible, with distal lobe bearing one short and two long teeth and sometimes with additional lobes. Superior claws of anterior legs enlarged, multidentate, of posterior legs small, not multidentate. Female palp absent. Without posterior spiracles or tracheae, with anterior tracheae restricted to abdomen. No colulus.

KEY TO SPECIES
OF *SYMPHYTOGNATHA*

1. Males 2
- Females 4
2. Chelicerae with lateral lobes beside distal, tooth-bearing lobes (figs. 35, 36); tegulum elongate, chelate distally (figs. 37, 38) *chickeringi*
- Chelicerae without lateral lobes, with distal, tooth-bearing lobes only (figs. 2, 25); tegulum rounded, not chelate distally (figs. 8, 27) 3
3. Ventral edge of palpal conductor rounded (fig. 9) *globosa*
- Ventral edge of palpal conductor straight (fig. 28) *blesti*
4. Spermathecal duct coiling around spermathecae three times (figs. 12, 13) 5
- Spermathecal duct coiling around spermathecae only once (figs. 14, 73) 6
5. Spermathecal bulbs relatively widely spaced (fig. 13) *blesti*
- Spermathecal bulbs relatively closely spaced (fig. 12) *globosa*
6. Spermathecae without distinct posteromedian lobes (figs. 14, 73) 7
- Spermathecae with distinct posteromedian lobes (Balogh and Loksa, 1968, fig. 5) *brasiliiana*
7. Spermathecae widely separated; duct making complete coil (fig. 14) *goodnightorum*
- Spermathecae approximate; duct making incomplete coil (fig. 73) *gertschi*

Symphytognatha globosa Hickman
Figures 2-12, 30

Symphytognatha globosa Hickman, 1931, p. 1322, figs. 1-6, pl. 1 (holotype male and allotype female from Punch Bowl, Launceston, Tasmania, in Queen Victoria Museum, Launceston, not examined). Roewer, 1942, p. 1015, Bonnet, 1958, p. 4201.

Diagnosis. *Symphytognatha globosa* is closest to *S. blesti* but may be distinguished by the rounded ventral edge of the conductor (figs. 8, 9) and the relatively closely spaced spermathecae (fig. 12).

Male. Described by Hickman (1931).

Female. Described by Hickman (1931).

Material Examined. Tasmania: Risdon, June 1, 1937 (V. V. Hickman, AMNH), 2♂, 2♀, May 22, 1948 (V. V. Hickman, MCZ), 1♂, 1♀; Trevallyn, June 27, 1931 (V. V. Hickman, OM), 1♂, 1♀.

Distribution. Known only from Tasmania.

Symphytognatha blesti, new species

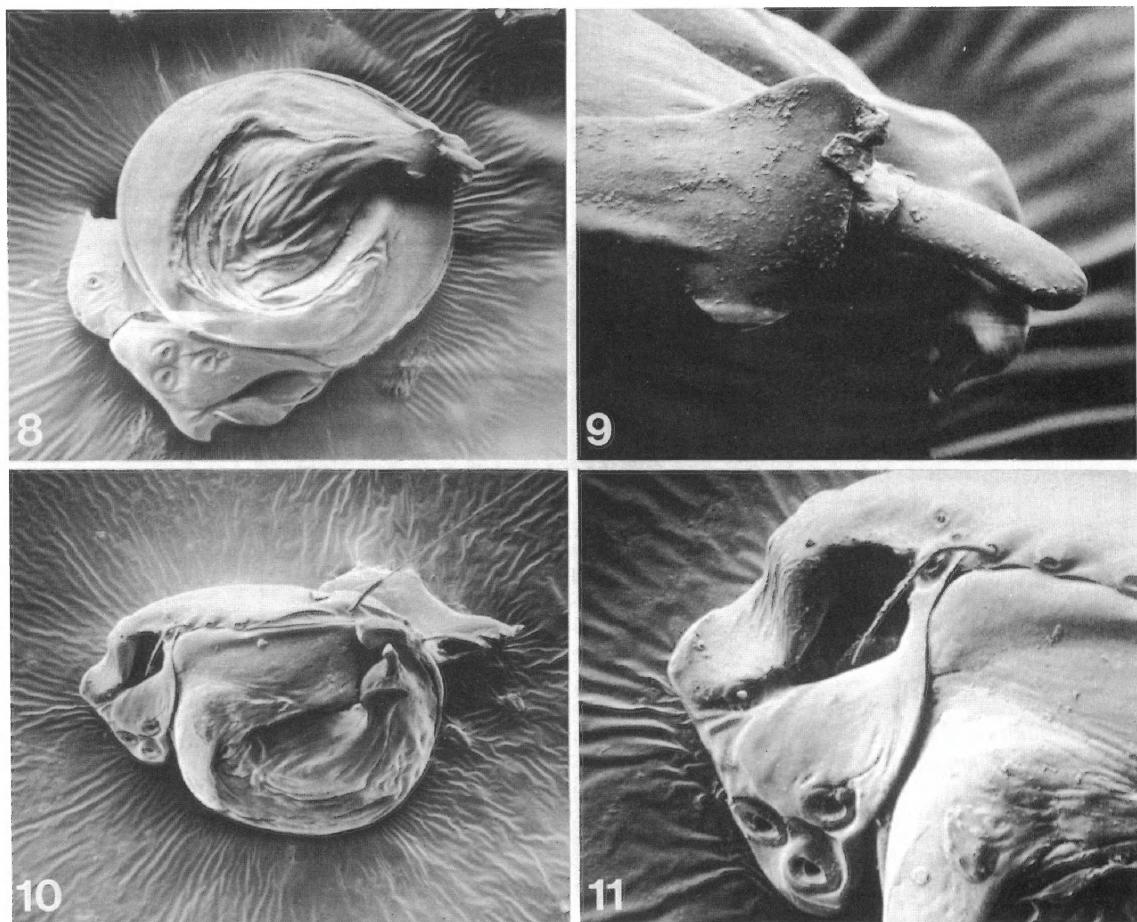
Figures 13, 23-29

Types. Male holotype from Biowra, New South Wales, Australia (January 15, 1976; D. Blest) and female paratype from Warrah, New South Wales, Australia (February 20, 1976; D. Blest), deposited in the Australian Museum, Sydney.

Etymology. The specific name is a patronym in honor of the collector of the type specimens.

Diagnosis. *Symphytognatha blesti* is closest to *S. globosa* but may be distinguished by the straight ventral edge of the conductor (figs. 27-29) and the relatively widely spaced spermathecae (fig. 13).

Male. Total length, not including chelicerae, 0.78. Carapace 0.33 long, 0.38 wide, 0.30 high. Abdomen 0.66 long, 0.49 wide, 0.60 high. Carapace brown, pars cephalica darkest, with scattered dark brown markings. Sternum and mouth-parts dark brown. Abdomen dark brown with scattered white markings. Legs light brown, darkest distally. Carapace with three widely spaced bristles in transverse row between anterior lateral eyes and two lateral bristles at posterior ridge of pars cephalica. Clypeus produced forward slightly at bottom, height at middle equal to almost twice the anterior lateral eye diameter. Ratio of eyes, anterior lateral: posterior lateral: posterior median, 4:5:5. Posterior median eyes separated by one-fifth their long diameter, by almost twice their diameter from posterior laterals; anterior laterals separated by six times their diameter; lateral eyes of each side contiguous. Chelicerae projecting forward distance equal to



FIGS. 8-11. *Sympytnognatha globosa* Hickman, male palp. 8. Retrolateral view, 280 \times . 9. Terminal elements, retrolateral view, 1375 \times . 10. Ventral view, 260 \times . 11. Cymbium, ventral view, 675 \times .

one-sixth of carapace length, bearing distal lobe with one short and two long teeth (fig. 25). Legs clothed with fine setae and long bristles, with one spine under metatarsus I. Leg formula 4123.

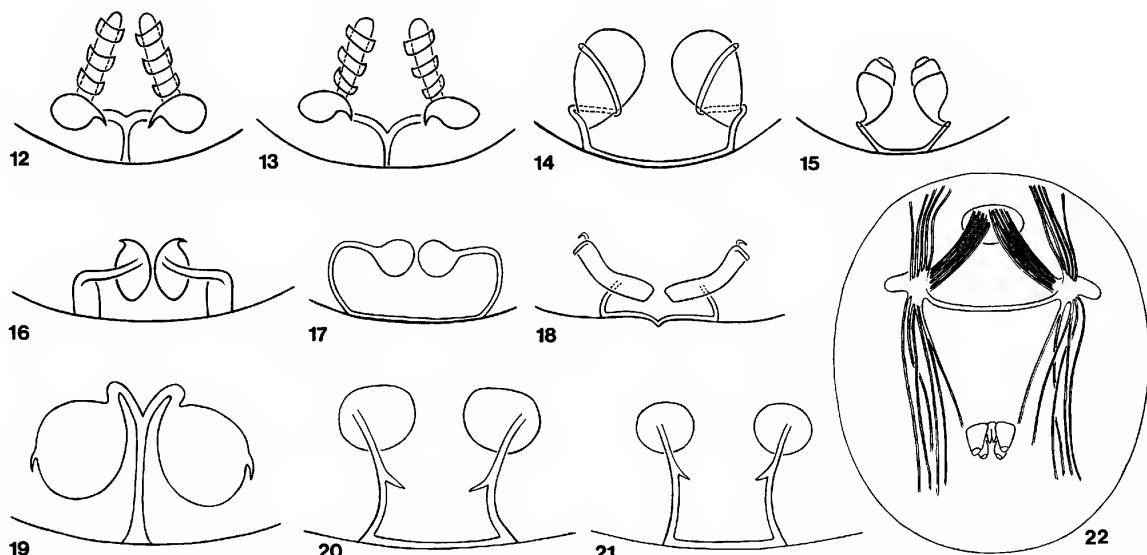
	I	II	III	IV
Femur	0.29	0.25	0.22	0.28
Patella	0.13	0.13	0.13	0.14
Tibia	0.16	0.15	0.14	0.16
Metatarsus	0.14	0.13	0.11	0.14
Tarsus	0.16	0.18	0.17	0.21
Total	0.88	0.84	0.77	0.93

Cymbium with dorsal notch (as in figs. 8, 10, 11). Median lobe of conductor with straight ventral edge (fig. 27), overlapping finger-like second and broad third lobes (fig. 29) over which em-

bolus tip protrudes (fig. 28); embolus subtegular, making single incomplete coil.

Female. As in male, except for the following: total length, not including chelicerae, 1.11. Carapace 0.36 long, 0.40 wide, 0.40 high. Abdomen 0.85 long, 0.86 wide, 0.91 high. Mouthparts light brown. Carapace with bristles behind posterior lateral eyes and paired at middle of cephalic ridge. Legs without spines.

	I	II	III	IV
Femur	0.27	0.24	0.20	0.26
Patella	0.13	0.13	0.12	0.13
Tibia	0.14	0.14	0.13	0.18
Metatarsus	0.13	0.12	0.11	0.13
Tarsus	0.15	0.15	0.17	0.20
Total	0.82	0.78	0.73	0.90



FIGS. 12-22. 12-21. Cleared female epigyna, ventral views. 12. *Symphytognatha globosa* Hickman. 13. *S. blesti*, new species. 14. *S. goodnightorum*, new species. 15. *Globignatha sedgwicki*, new species. 16. *Patu eberhardi*, new species. 17. *P. digua*, new species. 18. *P. saladito*, new species. 19. *Anapistula secreta* Gertsch. 20. *Curimagua chapmani*, new species. 21. *C. bayano*, new species. 22. *C. chapmani*, tracheal system, ventral view, diagrammatic.

Palp completely absent (figs. 23, 24). Epigynum with spermathecal bulbs relatively widely separated (fig. 13).

Material Examined. One male and 13 females taken with the paratype (OM, AMNH) and three females taken at the same locality on February 7 and 8, 1976 (OM).

Distribution. Known only from New South Wales, Australia. The specimens recorded by Wunderlich (1976) from the Sydney area as *S. globosa* probably belong to this species.

Symphytognatha brasiliiana Balogh and Loksa

Symphytognatha brasiliiana Balogh and Loksa, 1968, p. 287, figs. 1-6 (female holotype from Fazenda Agua Azul, Pará, Brazil, may be in the Hungarian Natural History Museum, Budapest, unavailable).

Diagnosis. *Symphytognatha brasiliiana* seems closest to *S. goodnightorum* and *S. gertschi* but may be distinguished by the medially approximate spermathecae with distinct posteromedian lobes (Balogh and Loksa, 1968, fig. 5).

Male. Unknown.

Female. Described by Balogh and Loksa (1968). The published description agrees well in

somatic characters with *S. goodnightorum* except for details of the chelicerae. Balogh and Loksa described only the two long cheliceral teeth, presumably overlooking the small tooth and unsclerotized lateral lobe because of their small size.

Material Examined. None; repeated requests to both authors of the species and to authorities at the Hungarian Natural History Museum have been unanswered.

Distribution. Known only from Pará, Brazil.

Symphytognatha goodnightorum, new species

Figures 14, 31-34

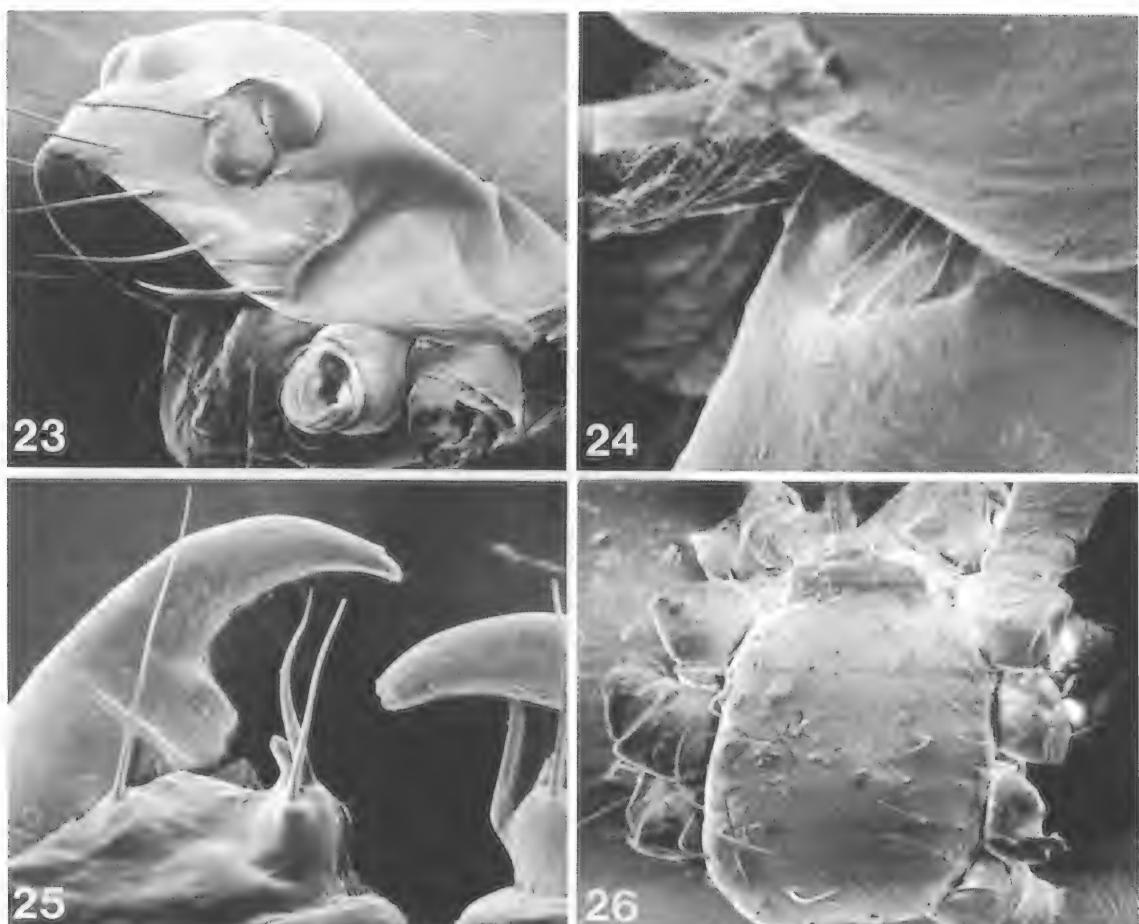
Type. Female holotype from Río Frío, near Augustine, Cayo, Belize (July 20, 1972; C. and M. Goodnight), deposited in AMNH.

Etymology. The specific name is a patronym in honor of the collectors of the holotype.

Diagnosis. *Symphytognatha goodnightorum* seems closest to *S. gertschi* but may be distinguished by the relatively wide median separation of the spermathecae and their lack of distinct posteromedian lobes (fig. 14).

Male. Unknown.

Female. Total length, not including chelicerae,

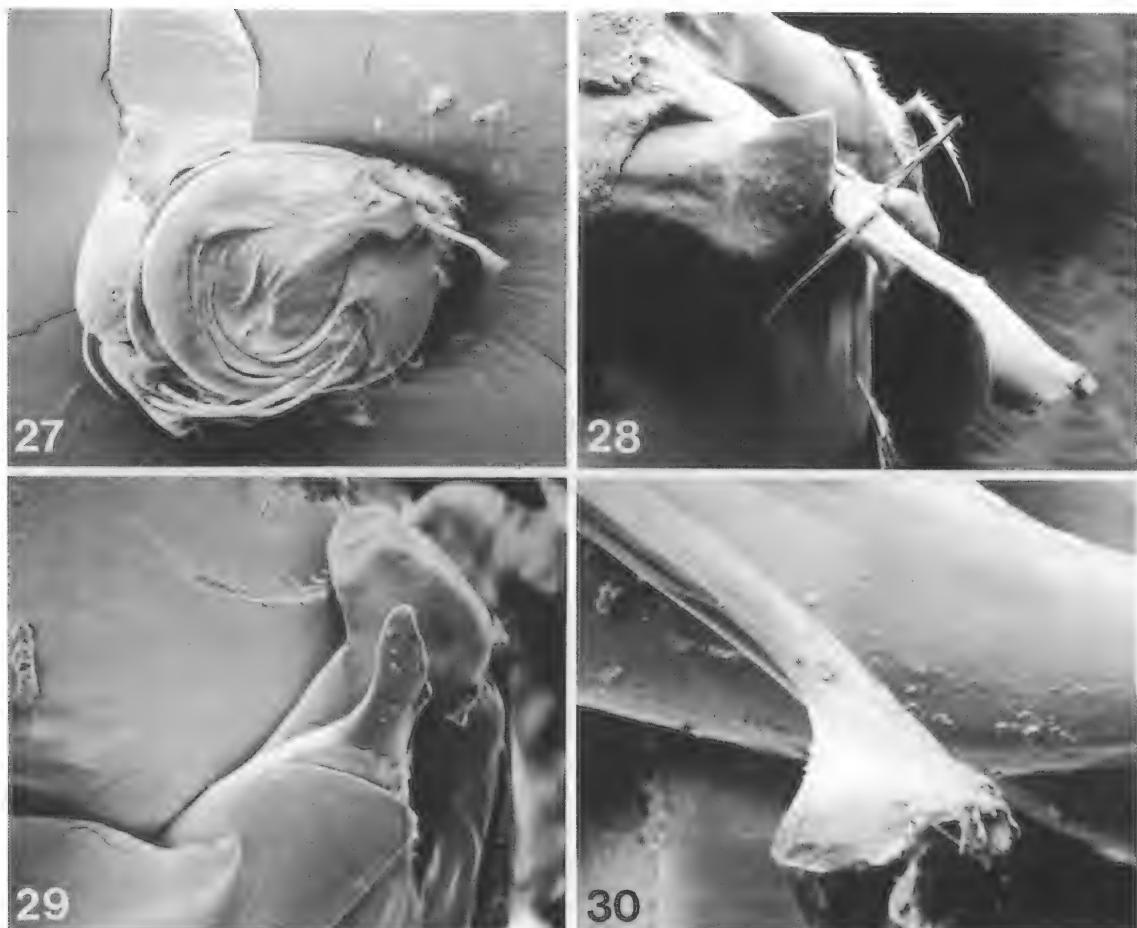


FIGS. 23-26. *Sympy tognatha blesti*, new species. 23. Carapace of female, lateral view, 210 \times . 24. Palpal area of female endite, lateral view, 2100 \times . 25. Chelicerae of male, anterior view, 1000 \times . 26. Sternum and labium of male, ventral view, 200 \times .

0.78. Carapace 0.27 long, 0.32 wide, 0.30 high. Abdomen 0.57 long, 0.62 wide, 0.67 high. Carapace light brown with scattered dark markings. Sternum light brown with darkened margins; mouthparts yellow. Abdomen pale beige with dark brown markings in large circle on each side. Legs yellow, darkest proximally. Carapace with bristles between posterior median eyes and lateral eyes of each side and paired median and lateral bristles at rear of pars cephalica. Clypeus almost horizontal, height at middle equal to long diameter of posterior median eye, with fine bristles at margin. Ratio of eyes, anterior lateral: posterior lateral: posterior median, 5:4:6. Posterior median eyes separated by two-thirds their long diameter, by one and one-half times their diameter from posterior laterals; anterior laterals

separated by four times their diameter; lateral eyes of each side contiguous. Sternum with sides slightly invaginated at each coxa. Chelicerae (fig. 31) projecting forward distance equal to one-fifth of carapace length, with distal lobe bearing one short and two long teeth, situated beside elongate, unsclerotized lateral lobe (fig. 32). Legs clothed with setae and bristles, without spines. Leg formula 1423.

	I	II	III	IV
Femur	0.28	0.23	0.16	0.23
Patella	0.12	0.11	0.09	0.10
Tibia	0.17	0.14	0.11	0.16
Metatarsus	0.12	0.10	0.08	0.11
Tarsus	0.18	0.15	0.15	0.16
Total	0.87	0.73	0.59	0.76



FIGS. 27-30. 27-29. *Symphytognatha blesti*, new species, male palp. 27. Retrolateral view, 250X. 28. Terminal elements, retrolateral view, 1000X. 29. Conductor, retrolateral view, 1000X. 30. *S. globosa* Hickman, embolus tip, retrolateral view, 2500X.

Palp completely absent. Epigynum with oval spermathecae surrounded by thin coiling duct (fig. 14).

Material Examined. Only the holotype

Distribution. Known only from Belize.

***Symphytognatha gertschi*, new species**
Figure 73

Type. Female holotype from 12 miles east of Manzanillo, latitude $19^{\circ} 01' N$, longitude $104^{\circ} 10' W$, Colima, Mexico (May 11, 1963; W. J. Gertsch and W. Ivie), deposited in AMNH.

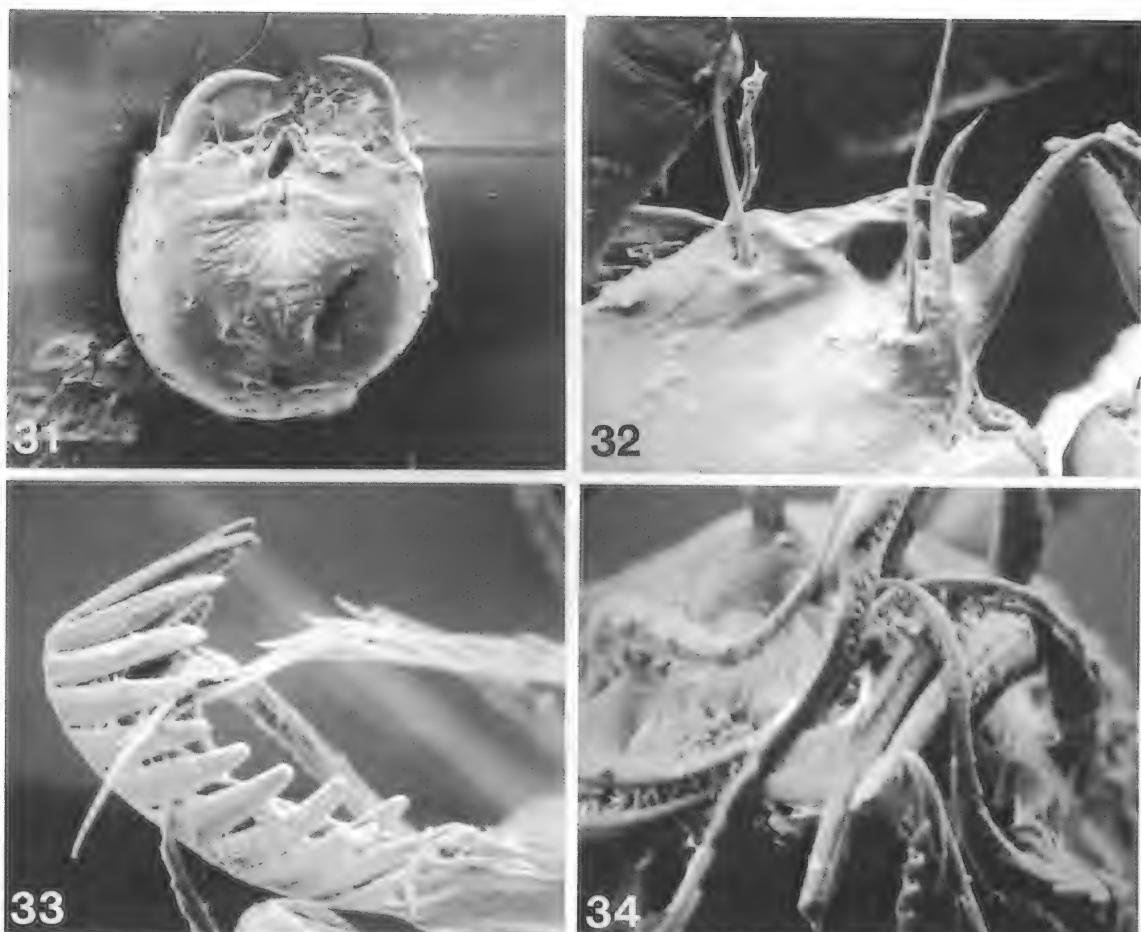
Etymology. The specific name is a patronym in honor of one of the collectors of the holotype.

Diagnosis. *Symphytognatha gertschi* seems

closest to *S. goodnightorum* but may be distinguished by the approximate spermathecae lacking posteromedian lobes (fig. 73).

Male. Unknown.

Female. Total length, not including chelicerae, 0.79. Carapace 0.29 long, 0.30 wide, 0.23 high. Abdomen 0.61 long, 0.54 wide, 0.61 high. Carapace light brown, lightest medially. Sternum yellowish brown with slightly darkened margins; mouthparts yellow. Abdomen pale beige with scattered brown markings. Legs yellow, darkest distally. Carapace with bristles in two pairs at rear of pars cephalica and singly between posterior median and between lateral eyes. Clypeus inclined forward ventrally, height at middle equal to long diameter of posterior median eyes, with



FIGS. 31-34. *Sympytognatha goodnightorum*, new species, female. 31. Chelicerae, anterior view, 260 \times . 32. Cheliceral teeth, anterior view, 1300 \times . 33. Superior claw of leg I, oblique ventral view, 2600 \times . 34. Claws of leg IV, distal view, 6500 \times .

strong marginal bristles laterally. Ratio of eyes, anterior lateral: posterior lateral: posterior median, 6:4:4. Posterior median eyes separated by half their long diameter, by their diameter from posterior laterals; anterior laterals separated by five times their diameter; lateral eyes of each side contiguous. Sternum with slight invaginations at each coxa. Chelicerae projecting forward distance equal to one-fourth of carapace length, apparently (under compound microscopy) with distal lobe bearing one slightly shortened and two long teeth, situated beside short, unsclerotized lateral lobe. Legs clothed with setae and bristles, without spines. Leg formula 1423.

	I	II	III	IV
Femur	0.24	0.22	0.18	0.22
Patella	0.13	0.11	0.11	0.12
Tibia	0.22	0.14	0.13	0.18
Metatarsus	0.14	0.13	0.11	0.12
Tarsus	0.20	0.19	0.14	0.18
Total	0.93	0.79	0.67	0.82

Palp completely absent. Epigynum with oval, almost contiguous spermathecae, with ducts not surrounding spermathecae (fig. 73).

Material Examined. Only the holotype.

Distribution. Known only from Colima, Mexico.

Symphytognatha chickeringi, new species

Figures 35-39

Type. Male holotype from Hardwar Gap, Portland Parish, Jamaica (June 27, 1954; A. M. Chickering), deposited in MCZ.

Etymology. The specific name is a patronym in honor of the collector of the holotype.

Diagnosis. *Symphytognatha chickeringi* is a distinctive species easily recognized by the presence of a conical dorsal protuberance on the abdomen (fig. 39).

Male. Total length, not including chelicerae, 0.76. Carapace 0.35 long, 0.34 wide, 0.28 high. Abdomen 0.47 long, 0.50 wide, 0.73 high. Carapace light brown with scattered dark markings. Sternum dark brown, mouthparts light brown. Abdomen brownish gray with scattered pale spots most numerous toward venter. Legs light brown, darkest ventrodistally. Carapace with bristles missing but paired median and lateral sockets visible at posterior ridge of pars cephalica. Clypeus concave, height at middle equal to twice the anterior lateral eye diameter, with extremely long median bristle. Ratio of eyes, anterior lateral: posterior lateral: posterior median,



35



36



37



38

FIGS. 35-38. *Symphytognatha chickeringi*, new species, male. 35. Chelicerae, anterior view, 260X. 36. Cheliceral teeth, anterior view, 1300X. 37. Palp, retrolateral view, 650X. 38. Terminal elements of palp, retrolateral view, 2600X.

10:11:13. Posterior median eyes separated by one-third their long diameter, by their diameter from posterior laterals; anterior laterals separated by four and one-half times their diameter; lateral eyes of each side contiguous. Sternum with sides slightly invaginated at each coxa. Chelicerae (fig. 35) projecting forward distance equal to one-third of carapace length, with distal lobe bearing one short and two long teeth, situated beside elongate, unsclerotized lateral lobe (fig. 36). Legs clothed with setae and bristles, without spines. Leg formula 1243.

	I	II	III	IV
Femur	0.33	0.30	0.21	0.27
Patella	0.14	0.12	0.12	0.11
Tibia	0.19	0.18	0.13	0.17
Metatarsus	0.14	0.13	0.12	0.12
Tarsus	0.22	0.21	0.19	0.15
Total	1.02	0.94	0.77	0.82

Palpal tegulum chelate terminally (figs. 37, 38). Embolus subtegular, making single incomplete coil.

Female. Unknown.

Material Examined. Only the holotype.

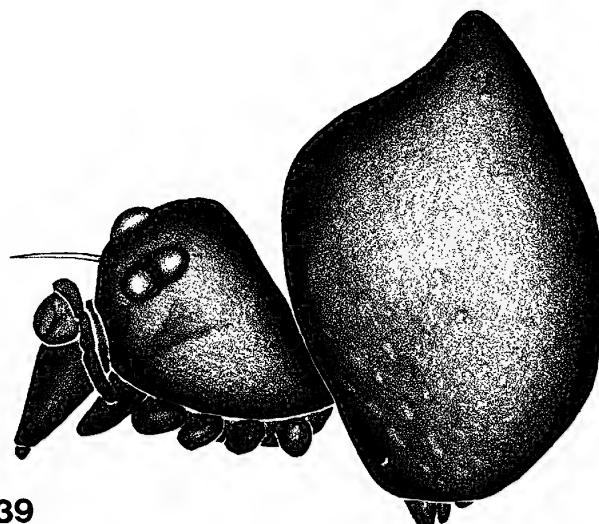
Distribution. Known only from Jamaica.

***GLOBIGNATHA* BALOGH AND LOKSA,
new rank**

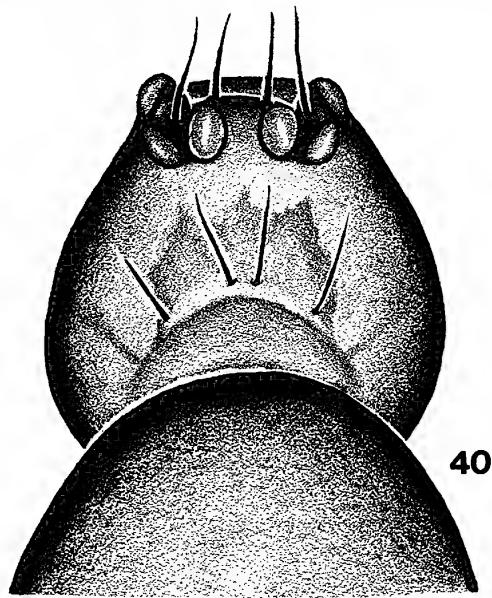
Globignatha Balogh and Loksa, 1968, p. 289 [type species by original designation *Symphytognatha* (*Globignatha*) *rohri* Balogh and Loksa]. Described as a subgenus of *Symphytognatha*.

Diagnosis. *Globignatha* may be easily recognized by the nearly complete fusion of the chelicerae into a huge hemisphere (fig. 41) with no suture line visible.

Description. Carapace widest between coxae II and III, rounded anteriorly, highest at rear of ocular area; pars cephalica greatly elevated, vertical posteriorly, pars thoracica steeply sloping. Six eyes in three diads. From above, posterior eye row recurved. Sternum convex, globose, wider than long, fourth coxae separated by more than twice their width. Labial suture line slightly recurved. Endites wider than long, strongly convergent, rounded into semicircle anteriorly. Chelicerae fused for about six-sevenths of their length, with no suture line visible, with medial long distal tooth and lateral distal lobe bearing one short and two long teeth. Superior claws of anterior legs not enlarged or multidentate. Fe-



39



40

FIGS. 39, 40. 39. *Sympytnognatha chickeringi*, new species, lateral view. 40. *Curimagua chapmani*, new species, dorsal view of carapace.

male palp absent. Without posterior spiracles. No colulus.

Ranking. We agree with Balogh and Loksa that *Globignatha* is the sister group of the true *Symphytognatha*. The non-multidentate superior claws, the lack of a cheliceral suture line, and the presence of a stout median tooth on the cheliceral margin support the recognition of this sister group relationship at the generic level.

Globignatha rohri Balogh and Loksa

Symphytognatha (Globignatha) rohri Balogh and Loksa, 1968, p. 289, figs. 7-10 (female holotype from Fazenda Água Azul, Pará, Brazil, may be in the Hungarian Natural History Museum, Budapest, unavailable).

Diagnosis. *Globignatha rohri* can be distinguished from *G. sedgwicki* by the contiguous spermathecae (Balogh and Loksa, 1968, fig. 8).

Male. Unknown.

Female. Described by Balogh and Loksa (1968). The published description agrees well in somatic characters with *G. sedgwicki* except for details of the chelicerae. Balogh and Loksa described only two long cheliceral teeth; probably the tripartite nature of the more laterally situated "tooth" was not resolvable by light microscopy.

Material Examined. None; see comments under *Symphytognatha brasiliiana*.

Distribution. Known only from Pará, Brazil.

Globignatha sedgwicki, new species

Figures 15, 41-44

Type. Female holotype from area between Belmopan and Stann Creek, Belize (July 1, 1975; W. Sedgwick), deposited in MCZ.

Etymology. The specific name is a patronym in honor of the collector of the holotype.

Diagnosis. *Globignatha sedgwicki* can be easily distinguished from *G. rohri* by the separated (rather than contiguous) spermathecae (fig. 15).

Male. Unknown.

Female. Total length, not including chelicerae, 1.35. Carapace 0.40 long, 0.53 wide, 0.56 high. Abdomen 0.96 long, 1.05 wide, 1.00 high. Carapace light brown with marginal pale white band and dark ocular area. Sternum, labium, and an-

terior surface of chelicerae dark brown, endites and posterior surface of chelicerae grayish. Abdomen almost completely covered with purple maculations, with dorsal pair of brown circular muscle impressions. Legs brown, darkest proximally and ventrally. Carapace with bristles at each lateral eye and along midline behind and in front of posterior median eyes. Clypeus sloping at 40 degree angle, height at middle equal to twice the anterior lateral eye diameter. Ratio of eyes, anterior lateral: posterior lateral: posterior median, 8:9:10. Posterior median eyes separated by one-third their long diameter, by one and one-half times their diameter from posterior laterals; anterior laterals separated by four and one-half times their diameter; lateral eyes of each side contiguous. Chelicerae massive (fig. 41), extending forward distance equal to more than half of carapace length, with median long tooth and lateral lobe bearing one short and two long teeth (figs. 42, 43). Legs clothed with setae and bristles, without spines. Leg formula 4312.

	I	II	III	IV
Femur	0.27	0.27	0.26	0.40
Patella	0.18	0.16	0.18	0.23
Tibia	0.14	0.15	0.15	0.27
Metatarsus	0.15	0.14	0.16	0.25
Tarsus	0.26	0.26	0.29	0.35
Total	1.00	0.98	1.04	1.50

Palp completely absent. Epigynum with separated, anteriorly twisted spermathecae (fig. 15).

Material Examined. Only the holotype.

Distribution. Known only from Belize.

PATU MARPLES

Patu Marples, 1951, p. 47 (type species by original designation *Patu vitiensis* Marples).

Diagnosis. *Patu* may be recognized by the combined presence of chelicerae fused only near their base, six eyes in diads, and an elevated pars cephalica.

Description. Carapace widest between coxae II and III, truncate anteriorly, highest at rear of ocular area; pars cephalica greatly elevated, vertical posteriorly, pars thoracica steeply sloping. Six eyes in three diads. From above, posterior eye row slightly recurved. Sternum elevated, globose,



FIGS. 41-44. *Globignatha sedgwicki*, new species, female. 41. Chelicerae, anterior view, 65 \times . 42. Cheliceral teeth, anterior view, 650 \times . 43. Cheliceral teeth, anterior view, 2600 \times . 44. Claws of leg I, oblique ventral view, 2600 \times .

length and width subequal, fourth coxae separated by almost three times their width. Labial suture line straight. Endites wider than long, convergent, not rounded anteriorly. Chelicerae fused for less than half their length, with two or more sharply pointed teeth. Superior claws of anterior legs not enlarged or multidentate. Female palp absent. Without posterior spiracles. Colulus may sometimes be present.

KEY TO SPECIES OF *PATU*

1. Males 2
- Females. 7
2. Embolus with several coils (figs. 51, 53). 3
- Embolus with a single coil (figs. 47, 48). 4
3. Cymbium with long distal process (figs. 51, 52). *eberhardi*
- Cymbium without long distal process (figs. 53, 54) *digua*
4. Embolus elevated, twisted (figs. 47, 48). 5
- Embolus not elevated, twisted (Forster, 1959, figs. 121, 126) 6
5. Palpal conductor relatively narrow (fig. 47) *vitiensis*
- Palpal conductor relatively wide (fig. 48) *samoensis*
6. Cymbium relatively large (Forster, 1959, figs. 120, 121) *woodwardi*
- Cymbium relatively small (Forster, 1959, figs. 126, 127) *marplesi*
7. Abdomen greatly prolonged behind spinnerets (Marples, 1951, figs. 1, 2). 8

Abdomen not greatly prolonged behind spinnerets 9

8. Abdomen with lateral protuberances (Marples, 1951, fig. 2) *samoensis*
Abdomen without lateral protuberances (Marples, 1951, fig. 1) *vitiensis*

9. Lateral epigynal ducts relatively short (fig. 18) *saladito*
Lateral epigynal ducts relatively long (figs. 16, 17) 10

10. Lateral epigynal ducts twisted (Forster, 1959, fig. 123) *woodwardi*
Lateral epigynal ducts not twisted (figs. 16, 17) 11

11. Lateral epigynal ducts widened basally (fig. 16) *eberhardi*
Lateral epigynal ducts not widened basally (fig. 17) *digua*

Patu vitiensis Marples
Figures 45-47

Patu vitiensis Marples, 1951, p. 47, figs. 1a-1f (one male and three female syntypes from Suva, Fiji, may be in the B. P. Bishop Museum, not examined). Forster, 1959, fig. 146.

Diagnosis. *Patu vitiensis* resembles *P. samoensis* in having the abdomen greatly prolonged behind the spinnerets, but lacks the lateral abdominal protuberances found in that species.

Male. Described by Marples (1951).

Female. Described by Marples (1951).

Material Examined. Fiji: Sawani, near Suva, July 19, 1956 (R. R. Forster, OM), 1♂, 6♀.

Distribution. Known only from Fiji.

Patu samoensis Marples
Figure 48

Patu samoensis Marples, 1951, p. 49, figs. 2a-2f (eight female syntypes from Apia, Upolu, Western Samoa, may be in the B. P. Bishop Museum, not examined); 1955, p. 475, pl. 56, fig. 19.

Diagnosis. *Patu samoensis* may be easily recognized by the lateral protuberances on the posteriorly prolonged abdomen (Marples, 1951, fig. 2a).

Male. Described by Marples (1955).

Female. Described by Marples (1951).

Material Examined. Samoa: Upolu (B. J.

Marples, AMNH), 1♂, 4♀; (MCZ), 2♂, 5♀; (OM), 1♂, 3♀.

Distribution. Known only from Samoa.

Patu woodwardi Forster
Figure 72

Patu woodwardi Forster, 1959, p. 318, figs. 118-123 (female holotype from Lae, New Guinea and male allotype from Benage, New Guinea, in Queensland Museum, not reexamined).

Diagnosis. The incompletely coiled embolus and large cymbium of the male palp (Forster, 1959, fig. 121) and twisted lateral epigynal ducts (Forster, 1959, fig. 123) are diagnostic.

Male. Described by Forster (1959).

Female. Described by Forster (1959). The chelicerae actually have two large teeth (fig. 72) and are fused at their base.

Material Examined. A female paratype taken with the holotype (OM).

Distribution. Known only from New Guinea.

Patu marplesi Forster

Patu marplesi Forster, 1959, p. 320, figs. 124-127 (male holotype from Malolelei, Upolu, Western Samoa, in Queensland Museum, not reexamined).

Diagnosis. The incompletely coiled embolus and small cymbium of the male palp (Forster, 1959, figs. 126, 127) are diagnostic.

Male. Described by Forster (1959). The chelicerae probably have two teeth and are presumably fused at their base.

Female. Unknown.

Material Examined. None.

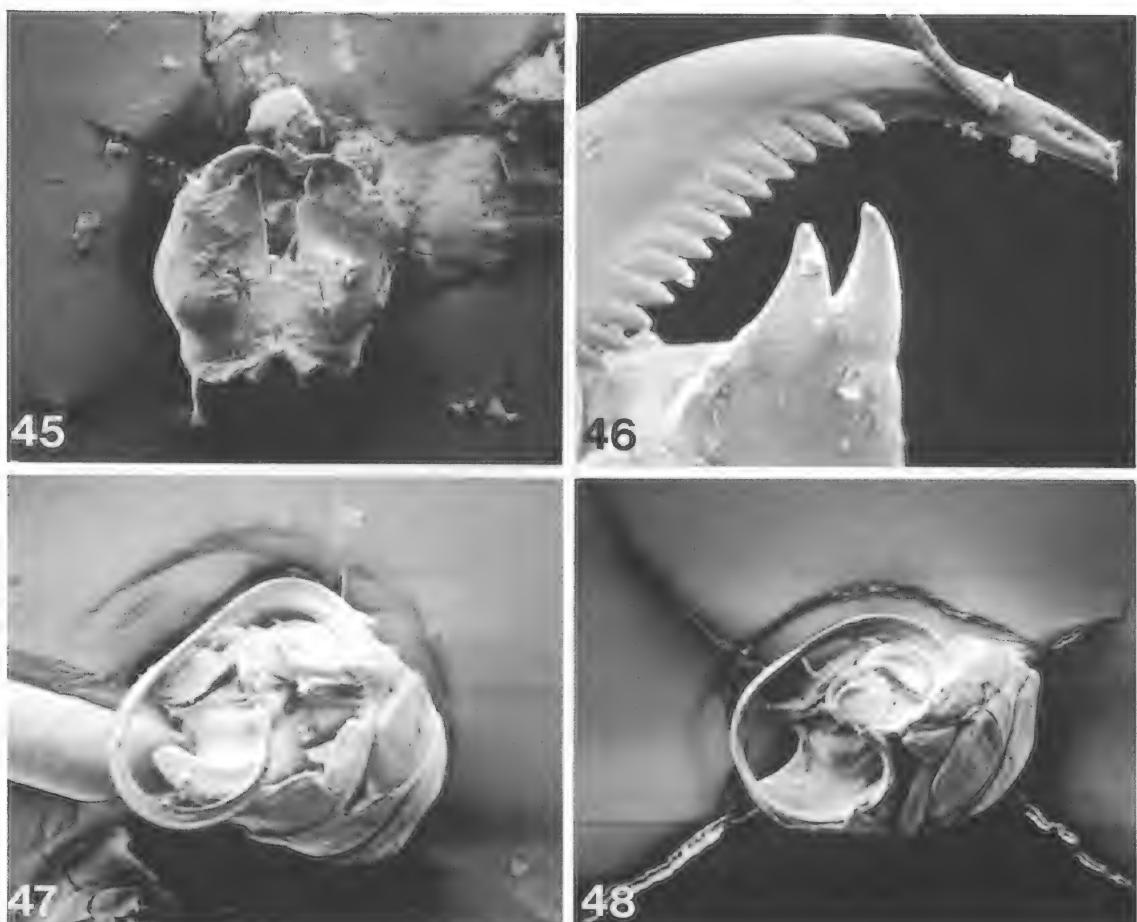
Distribution. Known only from Samoa.

Patu eberhardi, new species
Figures 16, 49-52

Types. Male holotype and female paratype from Río Digua, near Queremal, Valle del Cauca, Colombia (June 19, 1970; W. G. Eberhard), deposited in MCZ.

Etymology. The specific name is a patronym in honor of the collector of the type specimens.

Diagnosis. *Patu eberhardi* seems closest to *P. digua*; the embolus has several coils in both



FIGS. 45-48. 45-47. *Patu vitiensis* Marples, male. 45. Chelicerae, posterior view, 260X. 46. Cheliceral teeth, posterior view, 2600X. 47. Palp, retrolateral view, 260X. 48. *P. samoensis* Marples, male palp, retrolateral view, 260X.

species. Males of the former species can be distinguished by the long distal process on the cymbium (figs. 51, 52), females by their basally widened lateral epigynal ducts (fig. 16).

Male. Total length, not including chelicerae, 0.44. Carapace 0.20 long, 0.23 wide, 0.24 high. Abdomen 0.32 long, 0.27 wide, 0.33 high. Carapace light brown with pars cephalica darkened. Sternum light brown with darkened margins; labium dark brown, endites and chelicerae light brown. Abdomen uniformly gray. Legs light brown, darkest distally. Pars cephalica tremendously elevated, with median eyes situated considerably above laterals, which are on slightly

produced lobes. Carapace with weak bristles between posterior median eyes and paired laterally at rear of pars cephalica. Clypeus vertical, height at middle equal to four times the anterior lateral eye diameter. Ratio of eyes, anterior lateral: posterior lateral: posterior median, 4:6:6. Posterior median eyes separated by their long diameter, by their diameter from posterior laterals; anterior laterals separated by five times their diameter; lateral eyes of each side contiguous. Sternum invaginated at each coxa. Chelicerae with at least three teeth (fig. 49). Legs clothed with setae and bristles; metatarsus I with ventro-distal spine. Leg formula 1423.

	I	II	III	IV
Femur	0.15	0.12	0.09	0.17
Patella	0.09	0.09	0.05	0.05
Tibia	0.13	0.10	0.06	0.12
Metatarsus	0.05	0.05	0.05	0.06
Tarsus	0.13	0.13	0.12	0.12
Total	0.55	0.49	0.37	0.52

Cymbium with elongate and hooklike distal processes (fig. 52). Embolus with four coils (fig. 51).

Female. As in male except for the following: total length, not including chelicerae, 0.67. Carapace 0.23 long, 0.25 wide, 0.23 high. Abdomen 0.47 long, 0.44 wide, 0.55 high. Clypeus inclined

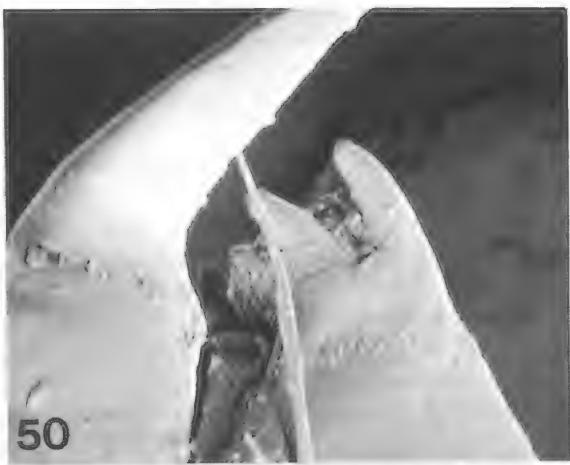
at 30 degree angle. Ratio of eyes, 4:5:5. Anterior lateral eyes separated by four times their diameter. Chelicerae apparently with four teeth (fig. 50).

	I	II	III	IV
Femur	0.21	0.18	0.14	0.18
Patella	0.10	0.07	0.05	0.06
Tibia	0.14	0.12	0.10	0.14
Metatarsus	0.08	0.06	0.06	0.06
Tarsus	0.14	0.13	0.13	0.14
Total	0.67	0.56	0.48	0.58

Palp completely absent. Epigynum with basally



49



50



51



52

FIGS. 49-52. *Patu eberhardi*, new species. 49. Cheliceral teeth of female, anterior view, 2600 \times . 50. Cheliceral teeth of male, anterior view, 2600 \times . 51. Male palp, retrolateral view, 260 \times . 52. Cymbium, retrolateral view, 1300 \times .

widened lateral ducts leading to spermathecae (fig. 16).

Material Examined. One male taken with the types (MCZ).

Distribution. Known only from Valle, Colombia.

***Patu digua*, new species**

Figures 17, 53-55

Types. Male holotype and female paratype from Río Digua, near Queremal, Valle del Cauca, Colombia (June 19, 1970; W. G. Eberhard), deposited in MCZ.

Etymology. The specific name is a noun in apposition taken from the type locality.

Diagnosis. *Patu digua* seems closest to the sympatric *P. eberhardi* but may be distinguished by the shorter distal processes of the cymbium (figs. 53, 54) and the uniformly narrow lateral epigynal ducts (fig. 17).

Male. Total length, not including chelicerae, 0.37. Carapace 0.15 long, 0.18 wide, 0.13 high. Abdomen 0.25 long, 0.29 wide, 0.31 high. Carapace yellow with ocular area slightly darkened. Sternum yellow, mouthparts dark brown. Abdomen gray, darkest ventrally. Legs yellow proximally, brown distally. Pars cephalica moderately elevated, lateral eyes on slightly produced lobes. No bristles or sockets visible. Clypeus concave, height at middle equal to twice the anterior lateral eye diameter. Ratio of eyes, anterior lateral: posterior lateral: posterior median, 5:7:6. Posterior median eyes separated by half their long diameter, by their diameter from posterior laterals; anterior laterals separated by almost four times their diameter; lateral eyes of each side contiguous. Sternum not invaginated at coxae. Chelicerae apparently with only two teeth (as in fig. 55). Legs clothed with setae and bristles, without spines. Leg formula 1423.

	I	II	III	IV
Femur	0.17	0.14	0.10	0.14
Patella	0.07	0.06	0.05	0.06
Tibia	0.12	0.09	0.07	0.09
Metatarsus	0.05	0.05	0.05	0.06
Tarsus	0.13	0.11	0.11	0.12
Total	0.54	0.45	0.38	0.47

Cymbium with short distal processes (fig. 54). Embolus with three coils (fig. 53).

Female. As in male except for the following: total length, not including chelicerae, 0.59. Carapace 0.29 long, 0.28 wide, 0.24 high. Abdomen 0.43 long, 0.49 wide, 0.56 high. Mouthparts yellow. Ratio of eyes, 5:6:6.

	I	II	III	IV
Femur	0.28	0.22	0.14	0.23
Patella	0.11	0.10	0.07	0.09
Tibia	0.18	0.14	0.10	0.14
Metatarsus	0.12	0.10	0.08	0.11
Tarsus	0.17	0.16	0.13	0.15
Total	0.86	0.72	0.52	0.72

Palp completely absent. Epigynum with long, un-twisted, uniformly narrow lateral ducts (fig. 17).

Material Examined. Two females taken with the types (MCZ).

Distribution. Known only from Valle, Colombia.

***Patu saladito*, new species**

Figures 1, 18, 56

Type. Female holotype from an elevation of 1800 m. near Saladito, Valle del Cauca, Colombia (October, 1975; W. G. Eberhard), deposited in MCZ.

Etymology. The specific name is a noun in apposition taken from the type locality.

Diagnosis. *Patu saladito* is a distinctive species easily recognized by the rectangular spermathecae (fig. 18).

Male. Unknown.

Female. Total length, not including chelicerae, 0.67. Carapace 0.31 long, 0.30 wide, 0.23 high. Abdomen 0.48 long, 0.46 wide, 0.51 high. Carapace light brown with scattered dark markings. Sternum dark brown, mouthparts grayish brown. Abdomen uniformly gray, iridescent. Legs yellow proximally, brown distally. Pars cephalica moderately elevated, lateral eyes flush with carapace. No bristles or sockets visible. Clypeus inclined at 10 degree angle, height at middle equal to three times the anterior lateral eye diameter. Ratio of eyes, anterior lateral: posterior lateral: posterior median, 4:4:5. Posterior median eyes separated by almost their long diameter, by their diameter from posterior laterals; anterior lateral eyes separated by four times their diameter; lateral eyes of each side contiguous. Sternum not



FIGS. 53-56. 53-55. *Patu digua*, new species. 53. Male palp, retrolateral view, 625 \times . 54. Cymbium, retrolateral view, 2600 \times . 55. Cheliceral teeth of female, anterior view, 2500 \times . 56. *P. saladito*, new species, cheliceral teeth of female, median view, 2500 \times .

invaginated at coxae. Chelicerae with at least eight teeth (fig. 56). Legs clothed with setae and bristles, without spines. Leg formula 4123.

	I	II	III	IV
Femur	0.24	0.21	0.13	0.22
Patella	0.12	0.09	0.06	0.08
Tibia	0.14	0.10	0.08	0.13
Metatarsus	0.11	0.09	0.08	0.10
Tarsus	0.14	0.15	0.15	0.17
Total	0.75	0.64	0.50	0.70

Palp completely absent. Epigynum with long, rectangular spermathecae bearing twisted tips (fig. 18).

Material Examined. One juvenile taken from a

web (fig. 1) at the type locality and probably belonging to this species (MCZ).

Distribution. Known only from Valle, Colombia.

ANAPISTULA GERTSCH

Anapistula Gertsch, 1941, p. 2 (type species by original designation *Anapistula secreta* Gertsch).

Diagnosis. *Anapistula* may be recognized by the combined presence of eyes in diads and an only slightly elevated pars cephalica.

Description. Carapace widest opposite coxae II, truncate anteriorly, highest at rear of pars cephalica; pars cephalica only slightly elevated, pars thoracica smoothly sloping. Four or six eyes

in diads. If median eyes present, posterior eye row slightly recurved. Sternum elevated, globose, length and width subequal, fourth coxae separated by almost three times their width. Labial suture line slightly procurved. Endites wider than long, convergent, rounded anteromedially. Chelicerae fused for less than half their length, with two sharply pointed teeth. Superior claws of anterior legs not enlarged or multidentate. Female palp absent. With posterior spiracles and tracheae. Colulus may sometimes be present.

coxae. Chelicerae with two sharp teeth (fig. 61). Legs clothed with setae and bristles, without spines. Leg formula 1243.

	I	II	III	IV
Femur	0.29	0.23	0.16	0.20
Patella	0.09	0.07	0.06	0.08
Tibia	0.18	0.16	0.12	0.14
Metatarsus	0.11	0.10	0.07	0.10
Tarsus	0.20	0.18	0.18	0.19
Total	0.87	0.74	0.59	0.71

KEY TO SPECIES OF *ANAPISTULA*

1. Males 2
Females. 3
2. Four eyes. *secreta*
Six eyes. *boneti*
3. Median epigynal duct reaching anterior tip of spermathecal bulb (fig. 19) 4
Median epigynal duct not reaching anterior tip of spermathecal bulb (fig. 74) *benoiti*
4. Median epigynal duct relatively narrow (fig. 19); America *secreta*
Median epigynal duct relatively wide (Forster, 1959, fig. 132); Australia *australia*

Anapistula secreta Gertsch

Figures 19, 57-61

Anapistula secreta Gertsch, 1941, p. 2, figs. 14-17 (female holotype from Barro Colorado Island, Panama Canal Zone, in AMNH, examined). Forster, 1958, p. 13.

Diagnosis. *Anapistula secreta* seems closest to *A. australis*. Males of the latter species are unknown; females of the former may be distinguished by the much narrower median epigynal duct (fig. 19).

Male. Total length, not including chelicerae, 0.59. Carapace 0.23 long, 0.22 wide, 0.11 high. Abdomen 0.31 long, 0.24 wide, 0.27 high. Carapace uniformly pale yellow. Sternum pale yellow, mouthparts slightly darker. Abdomen pale white with long gray setae. Legs pale yellow, darkest distally. No bristles or sockets visible on carapace. Clypeus vertical, height at middle equal to twice the anterior lateral eye diameter. Four eyes in two diads. Ratio of eyes, anterior lateral: posterior lateral, 3:2. Posterior lateral eyes separated by four times their diameter, lateral eyes of each side contiguous. Sternum not invaginated at

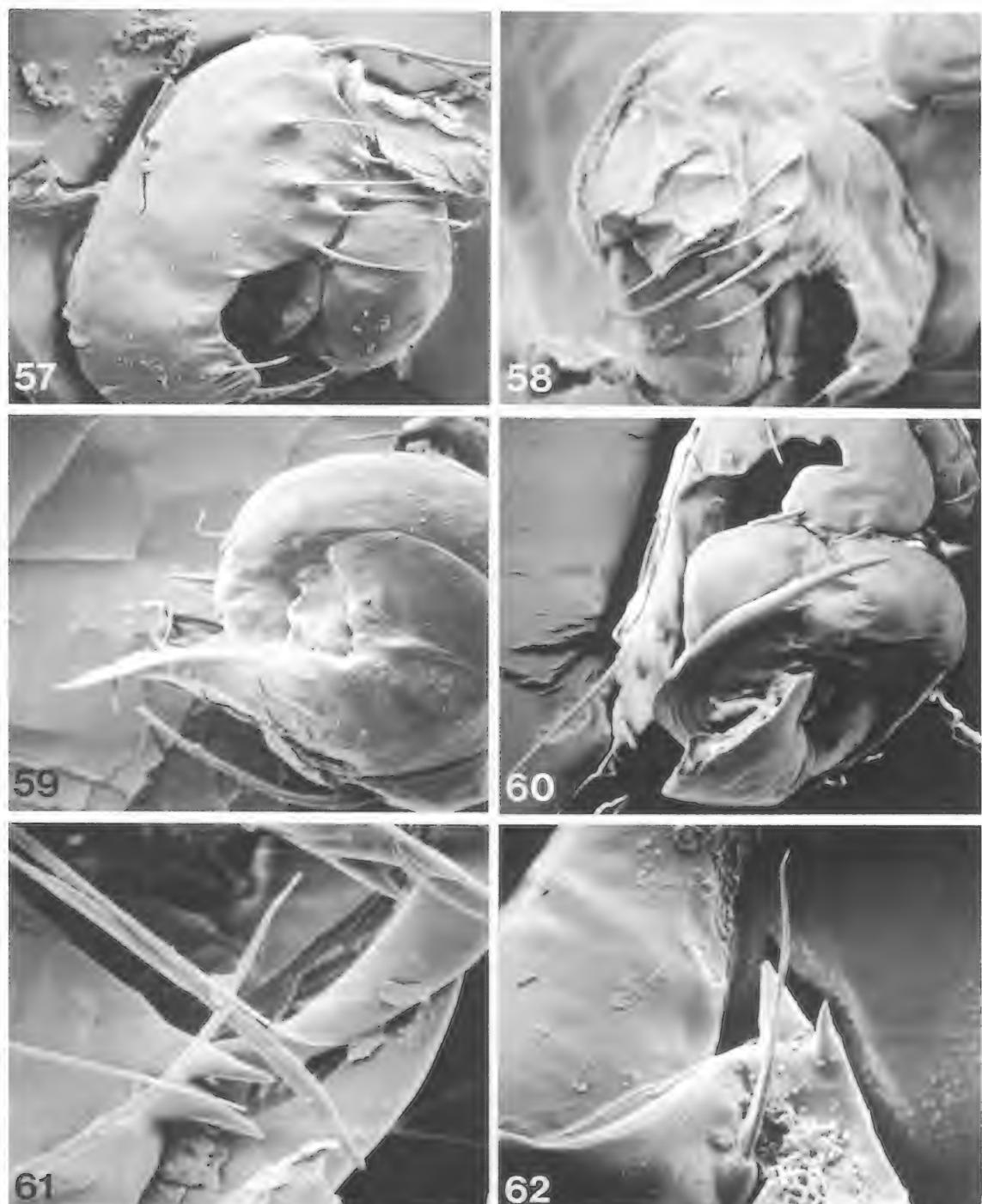
Palp with long conductor covering curved embolus (figs. 57-60).

Female. Described by Gertsch (1941).

Material Examined. Bahama Islands: South Bimini, Aug., 1951 (C. and P. Vaurie, AMNH), 1♀; Mar. 22-28, 1953 (A. M. Nadler, AMNH), 1♀. Colombia: Amazonas: 7 km. N Leticia, Feb. 20-25, 1972, Berlese sample of forest litter (S. and J. Peck, FMNH), 1♂, 1♀. Meta: Villavicencio, Mar. 1-4, 1972, elevation 500 m., Berlese sample of forest litter (S. and J. Peck, FMNH), 1♀; 23 km. NW Villavicencio, Mar. 5, 1972, elevation 1000 m., Berlese sample of forest litter (S. and J. Peck, FMNH), 1♂, 1♀. Costa Rica: Puntarenas: San Vito, Las Cruces, Mar. 16, 1973, elevation 4000 ft., Berlese sample of banana root litter (J. Wagner and J. Kethley, FMNH), 1♀; Mar. 19, 1973, Berlese sample of epiphytic humus (J. Wagner and J. Kethley, FMNH), 1♂, 1♀. Jamaica: Mason River, Aug. 18, 1974, elevation 2300 ft., Berlese sample of sifted sphagnum (S. Peck, FMNH), 2♀. Mexico: Chiapas: Ocosingo, June 25, 1950 (C. and M. Goodnight and C. J. Standard, AMNH), 1♀. Colima: Miramar, Jan. 15, 1943 (F. Bonet, AMNH), 1♀. Panama: Canal Zone: Barro Colorado Island, July, 1943-Mar., 1944, Berlese sample (J. Zetek, MCZ), 1♀. United States: Florida: Highlands Co.: Archbold Biological Station, Apr., 1956, deep moist litter under myrtles (C. C. Hoff, AMNH), 1♀; 8 mi. S Lake Placid, Feb. 2-15, 1970, turkey oak and slash pine litter (V. Roth, AMNH), 4♂, 12♀. Monroe Co.: N end, Key Largo, Mar. 10, 1968, Berlese sample of forest litter (S. Peck, FMNH), 1♂, 1♀.

Distribution. Florida, the Bahamas, Jamaica, and Mexico, south to southern Colombia.

Note. Specimens with depigmented and pos-



FIGS. 57-62. 57-61. *Anapistula secreta* Gertsch. 57. Male palp (Florida), ventral view, 1100 \times . 58. Male palp (Colombia), ventral view, 1250 \times . 59. Male palp (Colombia), retrolateral view, 1200 \times . 60. Male palp (Costa Rica) with conductor removed, retrolateral view, 1200 \times . 61. Cheliceral teeth of male, anterior view, 2500 \times . 62. *A. boneti* Forster, cheliceral teeth of penultimate male, anterior view, 2500 \times .

sibly non-functional eyes are sometimes found together with fully pigmented specimens.

Anapistula australis Forster

Anapistula australis Forster, 1959, p. 321, figs. 128-132, 158 (female holotype from Camp Mountain, Queensland, Australia, in the Queensland Museum, not reexamined).

Diagnosis. *Anapistula australis* seems closest to *A. secreta* but may be distinguished by the much wider median epigynal duct (Forster, 1959, fig. 132).

Male. Unknown.

Female. Described by Forster (1959).

Material Examined. None.

Distribution. Known only from Queensland, Australia.

two sharp teeth. Legs clothed with setae and bristles, without spines. Leg formula 1243.

	I	II	III	IV
Femur	0.25	0.25	0.22	0.24
Patella	0.12	0.12	0.08	0.11
Tibia	0.16	0.14	0.12	0.16
Metatarsus	0.13	0.11	0.11	0.11
Tarsus	0.16	0.14	0.12	0.14
Total	0.82	0.76	0.65	0.76

Palp completely absent. Epigynum with paired spermathecae connected by lateral branches to short median duct (fig. 74).

Material Examined. Only the holotype.

Distribution. Known only from Kivu, Zaire.

Anapistula benoiti, new species

Figure 74

Type. Female holotype from Vukaika Valley, Kambaila, Kivu, Zaire (June, 1973; M. Lejeune), deposited in MRAC.

Etymology. The specific name is a patronym in honor of Dr. P. L. G. Benoit, who made the holotype available for study.

Diagnosis. *Anapistula benoiti* differs from *A. secreta* and *A. australis* in that the median epigynal duct does not reach to the tip of the spermathecal bulbs (fig. 74).

Male. Unknown.

Female. Total length, not including chelicerae, 0.61. Carapace 0.18 long, 0.22 wide, 0.16 high. Abdomen 0.39 long, 0.42 wide, 0.49 high. Carapace pale brown, lightest medially. Sternum, labium, and endites pale brown, chelicerae slightly darker. Abdomen pale white with long gray setae. Legs pale brown, darkest distally. No bristles or sockets visible on carapace. Clypeus inclined forward at base, height at middle equal to one and one-half times the anterior lateral eye diameter. Four eyes in two diads. Ratio of eyes, anterior lateral: posterior lateral, 7:5. Posterior lateral eyes separated by three times their diameter, lateral eyes of each side contiguous. Sternum not invaginated at coxae. Chelicerae apparently (under compound microscopy) with

Anapistula benoiti Forster

Figure 62

Anapistula benoiti Forster, 1958, p. 13, figs. 15, 16, 18, 19, 21 (male holotype from Atoyac, Veracruz, Mexico, in AMNH, examined).

Iardinus benoiti: Gertsch, 1960, p. 9.

Diagnosis. *Anapistula benoiti* is a distinctive species easily recognized by the presence of posterior median eyes (Forster, 1958, figs. 15, 16).

Male. Described by Forster (1958).

Female. Unknown.

Material Examined. Two damaged penultimate males listed by Forster (1958).

Distribution. Known only from Veracruz, Mexico.

CURIMAGUA, NEW GENUS

Type Species. *Curimagua chapmani*, new species.

Etymology. The generic name is a Venezuelan place name considered feminine in gender.

Diagnosis. *Curimagua* may be easily recognized by the arrangement of the eyes in triads rather than diads (fig. 40). The presence of a remnant of the female pedipalp and the lack of cheliceral teeth are also diagnostic.

Description. Carapace widest opposite coxae III, rounded anteriorly, highest behind ocular area; pars cephalica moderately elevated, pars thoracica abruptly sloping. Six eyes in two triads. Posterior eye row slightly recurved. Sternum con-

vex, globose, wider than long, fourth coxae separated by more than twice their width. Labial suture line procurved. Endites wider than long, convergent, with anterior serrulae. Chelicerae fused for one-fifth of their length, reduced in size, surrounded ventrally and laterally by endites (fig. 63), margins without teeth, with short lobes only (fig. 64). Superior claws of anterior legs not enlarged or multidentate. Female palp present, represented by short, rounded stub (fig. 63). Without posterior spiracles, with anterior tracheae penetrating cephalothorax (fig. 22). No colulus detected.

Curimagua chapmani, new species

Figures 20, 22, 40, 63-68

Types. Male holotype and female paratype from roost of guacharo birds in entrance chamber of Coy-Coy Cave, 16 km. ESE of Curimagua, Serranía de San Luis, Falcón, Venezuela (April 19, 1973; P. Chapman), deposited in MCZ.

Etymology. The specific name is a patronym in honor of the collector of the type specimens.

Diagnosis. *Curimagua chapmani* may be distinguished from *C. bayano* by the shorter and distally unexpanded embolus tip (figs. 67, 68) and the larger, more closely spaced spermathecae (fig. 20).

Male. Total length, not including chelicerae, 0.80. Carapace 0.34 long, 0.36 wide, 0.16 high. Abdomen 0.51 long, 0.41 wide, 0.44 high. Carapace light brown with pars cephalica darkest. Sternum dark brown, mouthparts lighter. Abdomen light gray with median longitudinal and median transverse rows of large light spots. Legs pale yellow proximally, grading to light brown distally. Carapace with two stiff bristles between anterior lateral eyes and one bristle between posterior median eyes. Clypeus projecting forward slightly at tip, height at middle equal to almost twice the anterior lateral eye diameter. Ratio of eyes, anterior lateral: posterior lateral: posterior median, 5:6:6. Posterior median eyes separated by two-thirds of their diameter, contiguous with posterior laterals; anterior laterals separated by almost three times their diameter, lateral eyes of each side contiguous. Sternum not invaginated at coxae. Chelicerae with two low

lobes (fig. 64). Legs clothed with setae and strong bristles, without spines. Leg formula 4123.

	I	II	III	IV
Femur	0.29	0.27	0.21	0.26
Patella	0.11	0.13	0.12	0.13
Tibia	0.15	0.14	0.14	0.21
Metatarsus	0.13	0.14	0.13	0.14
Tarsus	<u>0.21</u>	<u>0.21</u>	<u>0.22</u>	<u>0.22</u>
Total	0.89	0.89	0.82	0.96

Palpal cymbium with denticles (fig. 66). Embolus, except for tip, subtegular, making almost complete single coil; tip relatively short, not expanded distally (figs. 67, 68).

Female. As in male except for the following: total length 1.16. Carapace 0.41 long, 0.47 wide, 0.20 high. Abdomen 0.84 long, 0.76 wide, 0.75 high. Clypeal height equal to one and one-half times the anterior lateral eye diameter. Ratio of eyes, 5:5:7. Posterior median eyes separated by almost their diameter; anterior laterals separated by less than two and one-half times their diameter. Leg formula 4132.

	I	II	III	IV
Femur	0.28	0.25	0.24	0.32
Patella	0.14	0.13	0.14	0.17
Tibia	0.16	0.16	0.17	0.25
Metatarsus	0.15	0.15	0.15	0.18
Tarsus	<u>0.23</u>	<u>0.22</u>	<u>0.23</u>	<u>0.27</u>
Total	0.96	0.91	0.93	1.19

Palp present, represented by unisegmented lobe (fig. 63). Spermathecae relatively large, closely spaced (fig. 20).

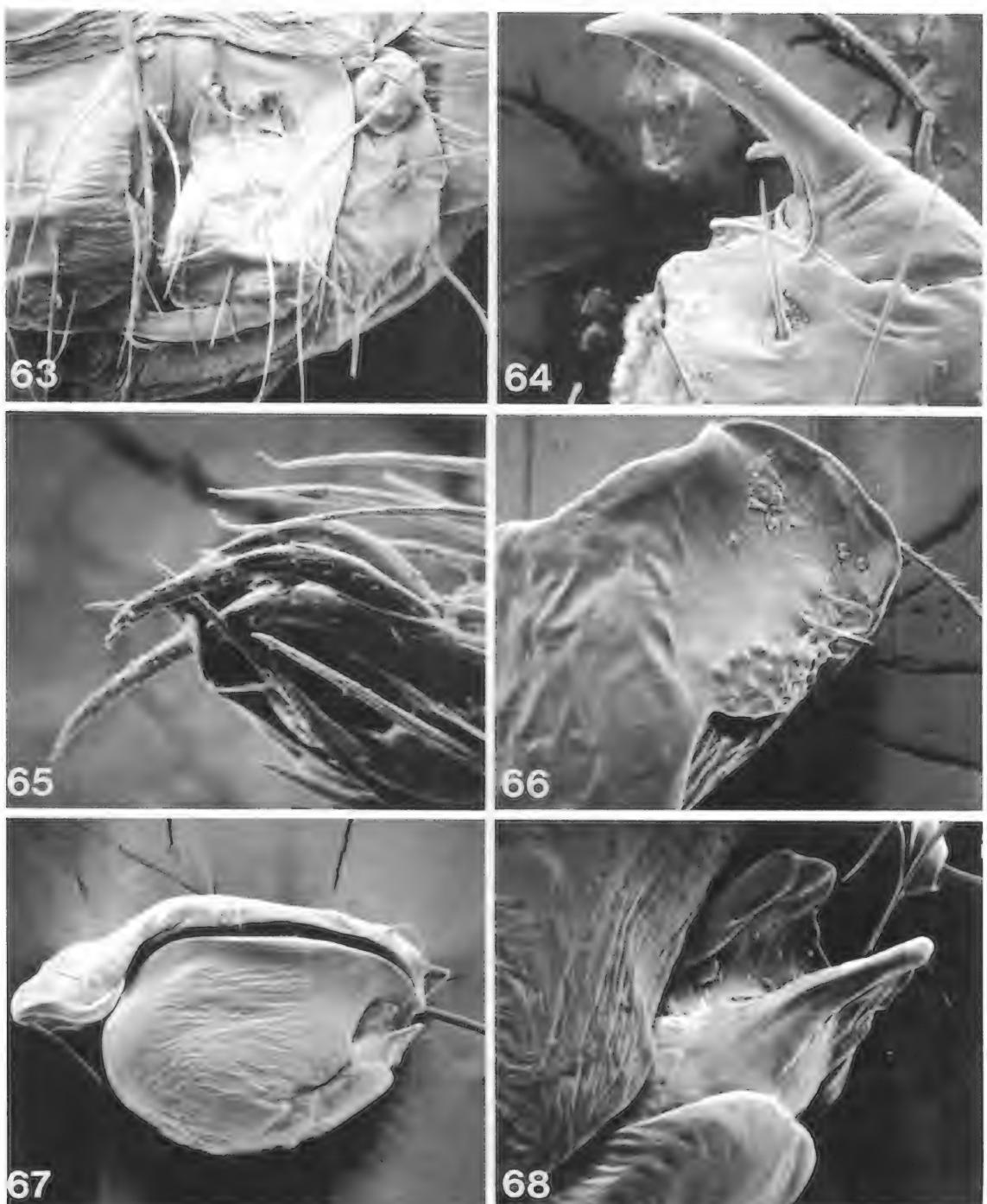
Material Examined. One male and two juveniles taken with the types (MCZ).

Distribution. Known only from Falcón, Venezuela.

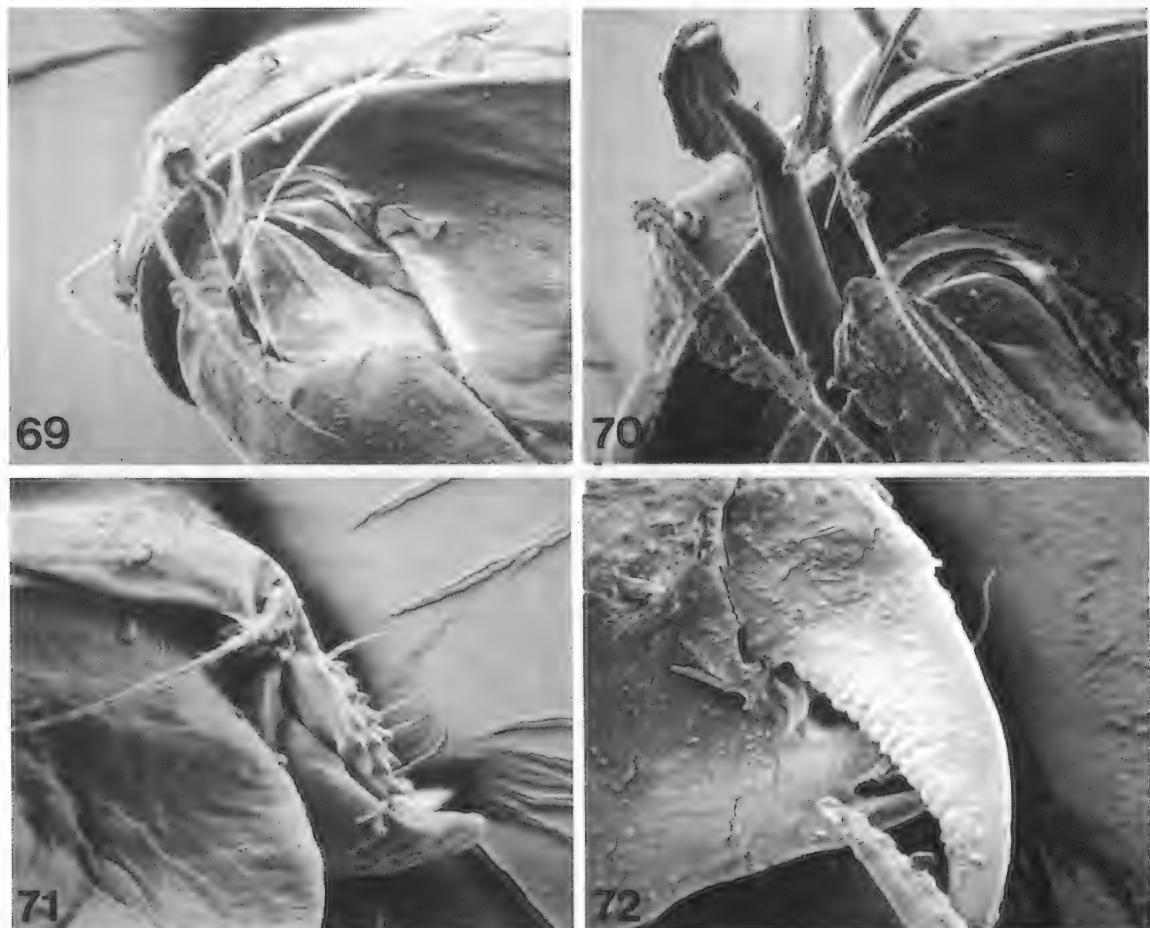
Curimagua bayano, new species

Figures 21, 69-71

Types. Male holotype and female paratype from a diplurid web at Bayano, Río Majé, Panamá,



FIGS. 63-68. *Curimagua chapmani*, new species. 63. Chelicerae, endite, and palp of juvenile female, anterior view, 650 \times . 64. Chelicera of male, anterior view, 1300 \times . 65. Claws of leg I of male, lateral view, 2600 \times . 66. Cymbium, retrolateral view, 1000 \times . 67. Male palp, ventral view, 500 \times . 68. Terminal elements of male palp, ventral view, 2000 \times .



FIGS. 69-72. 69-71. *Curimagua bayano*, new species. 69. Terminal elements of male palp, ventral view, 1250X. 70. Same, 2500X. 71. Cymbium, oblique ventral view, 1250X. 72. *Patu woodwardi* Forster, cheliceral teeth of female, posterior view, 2500X.

Panama (June 2, 1976; F. Vollrath), deposited in MCZ.

Etymology. The specific name is a noun in apposition taken from the type locality.

Diagnosis. *Curimagua bayano* may be distinguished from *C. chapmani* by the longer and distally expanded embolus tip (figs. 69, 70) and the smaller, more widely separated spermathecae (fig. 21).

Male. Total length, not including chelicerae, 0.99. Carapace 0.44 long, 0.39 wide, 0.19 high. Abdomen 0.75 long, 0.61 wide, 0.39 high. Carapace light brown with pars cephalica darkest. Sternum light brown, mouthparts lighter. Abdomen light gray with lighter median longitudinal

band. Legs light brown, darkest distally. Carapace with two stiff bristles between anterior lateral eyes. Clypeus almost vertical, height at middle equal to one and one-half times the anterior lateral eye diameter. Ratio of eyes, anterior lateral: posterior lateral: posterior median, 4:5:6. Posterior median eyes separated by two-thirds of their diameter, contiguous with posterior laterals; anterior laterals separated by three times their diameter, lateral eyes of each side contiguous. Sternum not invaginated at coxae. Chelicerae with two or three low lobes. Legs clothed with setae and long bristles, without spines. Leg formula 4123.

	I	II	III	IV
Femur	0.28	0.26	0.23	0.29
Patella	0.14	0.14	0.11	0.14
Tibia	0.18	0.17	0.18	0.23
Metatarsus	0.14	0.14	0.14	0.16
Tarsus	0.21	0.20	0.22	0.25
Total	0.95	0.91	0.88	1.07

Palpal cymbium with denticles (fig. 71). Embolus, except for tip, subtegular, making almost complete single coil; tip relatively long, expanded distally (Figs. 69, 70).

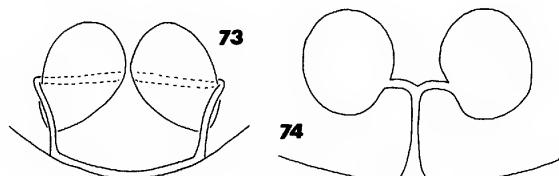
Female. As in male except for the following: total length 1.29. Carapace 0.50 long, 0.43 wide, 0.22 high. Abdomen 0.98 long, 0.74 wide, 0.71 high, with paired lateral as well as median longitudinal rows of light spots. Carapace with bristles between posterior median and posterior lateral eyes. Clypeus produced forward ventrally. Leg formula 4132.

	I	II	III	IV
Femur	0.30	0.29	0.27	0.29
Patella	0.15	0.15	0.15	0.18
Tibia	0.21	0.20	0.22	0.31
Metatarsus	0.18	0.15	0.16	0.20
Tarsus	0.23	0.22	0.23	0.30
Total	1.07	1.01	1.03	1.28

Palp present, represented by unisegmented lobe. Spermathecae relatively small, widely separated (fig. 21).

Material Examined. Only the types.

Distribution. Known only from Panamá, Panamá.



FIGS. 73, 74. Cleared female epigyna, ventral views. 73. *Symphytognatha gertschi*, new species. 74. *Anapistula benoiti*, new species.

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